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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/695,770 | 10/30/2003 | Ki-Hwan Park | SEC.1101 | 6935 |

20987 7590 09/08/2010
VOLENTINE & WHITT PLLC
ONE FREEDOM SQUARE
11951 FREEDOM DRIVE SUITE 1260
RESTON, VA 20190

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| EXAMINER |
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STINSON, FRANKIE L

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| ART UNIT | PAPER NUMBER |
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1711

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| NOTIFICATION DATE | DELIVERY MODE |
|-------------------|---------------|

09/08/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ptoinbox@volentine.com
cjohnson@volentine.com
aloomis@volentine.com

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|------------------------------|---------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 10/695,770 | Applicant(s) PARK ET AL. | |
| | Examiner FRANKIE L. STINSON | Art Unit 1711 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 1010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 5-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>10/30/03</u> . | 6) <input type="checkbox"/> Other: _____ |

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1. Claims 6-9 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on April 22, 2010.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Iwamoto et al. (U. S. Pat. No. 6,156,153) or Lu et al. (U. S. Pat. No. 6,416,587) in view of either Lee (U. S. Pat. No. 6,001,216) or USSR'768 (USSR 1063768) and Cheng (U. S. Pat. No. 5,885,403).

Re claim 1, Iwamoto is disclosing a semiconductor wafer cleaning system, comprising:

a cleaning chamber (2);

a wafer support (not shown) disposed within said chamber and configured to support a plurality of wafers within said chamber as spaced from one another in a first direction;

a source of cleaning solution (see "chemical", col. 4, lines 24-28) associated with said cleaning chamber such that said cleaning chamber can be filled with cleaning solution from said source;

a source of de-ionized water (see "pure water", col. 4, line 25);

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de-ionized water supply nozzles (5a, 5b, 5c) connected to said source of de-ionized water and oriented to spray deionized water from said source thereof into said chamber towards wafers supported by said wafer support,

each of the de-ionized water supply nozzles having a main body in the form of a pipe defining an inner nozzle passageway, and a plurality of sets of nozzle holes connected to the inner nozzle passageway, the main bodies of said de-ionized water supply nozzles extending longitudinally in said first direction at opposites sides of said wafer support, the nozzle holes of each said set lying in a plane perpendicular to said first direction, and said sets of nozzle holes being spaced from each other along the length of the main body, and

each said set of said nozzle holes subtending an angle about the inner nozzle passageway from which the set of nozzle holes extends so that the de-ionized water is sprayed through each said set of nozzle holes over a range as measured in the circumferential direction of the main body of the nozzle;

a discharge section including an overflow tank (3) surrounding an upper part of said cleaning chamber that differs from the claim only in the recitation of the holes subtending at an angle of 80~100°, the at least one discharge pipe connected to a lower part of said cleaning chamber, and the control means for controlling the rates at which de-ionized water is fed through said de-ionized water supply nozzles and at which fluid in said chamber is discharged via said discharge section. In regard to the angle, Lee (col. 5, lines 31-57) and USSR'768 (see 70-85 degree) are each cited disclosing holes subtending at an angle of 80~100° as claimed. It therefore would have been obvious to

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one having ordinary skill in the art, with predictable results, to modify the system/arrangement of Iwamoto, to include the angle of 80~100°, as taught by either Lee or USSR'768, with no change in their respective function, for the purposes of enhancing the washing of the wafer. It is old and well known, through routine experimentation, to position spraying arrangements in various angles, to optimize the washing effect (see MPEP 2144.04 REVERSAL, DUPLICATION OR RE-ARRANGEMENT OF PARTS). In regard to the at least one discharge pipe connected to a lower part of said cleaning chamber, Cheng (as at 87, 88) is cited disclosing the discharge pipe as claimed. It therefore would have been obvious to one having ordinary skill in the art, with predictable results, to modify the system/arrangement of Iwamoto, to include a discharge pipe connected to a lower part of said cleaning chamber as taught by Cheng, with no change in their respective function, for the purpose of enhancing the cleaning process. It is old and well known in the art to provide plural drains to rapidly remove processes liquids, in an effort to prevent any floating contaminants from re-depositing onto the wafer. In regard to the control means, although not shown, but understood to be inherent in the control of the pump (6a) in Iwamoto, Cheng (as at 78) is cited disclosing control means as claimed. It therefore would have been obvious to one having ordinary skill in the art, with predictable results, to modify the system/arrangement of Iwamoto, to include a control means as taught by Cheng, with no change in their respective function, for the purpose of automatically controlling the washing operation without active human involvement. It is old and well known to operate various mechanical systems through automation to remove human error. All of

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the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination, (i.e., the combination of known old elements into a single device) would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

In re Hutchison, 69 USPQ 138

Functional limitation must be evaluated and considered. However, it must be determined whether the functional limitation provides a positive limitation or only the ability to perform the claimed function. If it is only the ability to perform the function, the language does not constitute a limitation in any patentable sense.

MPEP 2114: APPARATUS AND ARTICLE CLAIMS—FUNCTIONAL LANGUAGE

APPARATUS CLAIMS MUST BE STRUCTURALLY DISTINGUISHABLE FROM THE PRIOR ART

>While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. >In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) (The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference); see also In re Swinehart, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971); < In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). “ [A]pparatus claims cover what a device is, not what a device does.” Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in original).

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**MANNER OF OPERATING THE DEVICE DOES NOT DIFFERENTIATE
APPARATUS CLAIM FROM THE PRIOR ART**

A claim containing a “ recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987) (The preamble of claim

1 recited that the apparatus was “ for mixing flowing developer material” and the body of the claim recited “ means for mixing ..., said mixing means being stationary and completely submerged in the developer material” . The claim was rejected over a reference which taught all the structural limitations of the claim for the intended use of mixing flowing developer. However, the mixer was only partially submerged in the developer material. The Board held that the amount of submersion is immaterial to the structure of the mixer and thus the claim was properly rejected.).

Re claim 1, Lu is cited disclosing a semiconductor wafer cleaning system (see “PRIOR ART”, figs 1 and 3a, comprising:

a cleaning chamber (5);

a wafer support (not shown) disposed within said chamber and configured to support a plurality of wafers within said chamber as spaced from one another in a first direction;

a source of de-ionized water (col. 3, lines 56-61);

de-ionized water supply nozzles (211, 212c) connected to said source of de-ionized water and oriented to spray deionized water from said source thereof into said chamber towards wafers supported by said wafer support,

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each of the de-ionized water supply nozzles having a main body in the form of a pipe defining an inner nozzle passageway, and a plurality of sets of nozzle holes connected to the inner nozzle passageway, the main bodies of said de-ionized water supply nozzles extending longitudinally in said first direction at opposites sides of said wafer support, the nozzle holes of each said set lying in a plane perpendicular to said first direction, and said sets of nozzle holes being spaced from each other along the length of the main body, and

each said set of said nozzle holes subtending an angle about the inner nozzle passageway from which the set of nozzle holes extends so that the de-ionized water is sprayed through each said set of nozzle holes over a range as measured in the circumferential direction of the main body of the nozzle;

a discharge section including an overflow tank (col. 4, line 46-53) surrounding an upper part of said cleaning chamber and

control means (col. 2, lines 54-57) for controlling the rates at which de-ionized water is fed through said de-ionized water supply nozzles and at which fluid in said chamber is discharged via said discharge section that differs from the claim only in the recitation of the holes subtending at an angle of 80~100°, the at least one discharge pipe connected to a lower part of said cleaning chamber and a source of cleaning solution associated with said cleaning chamber such that said cleaning chamber can be filled with cleaning solution from said source. In regard to the angle, Lee (col. 5, lines 31-57) and USSR'768 (see 70-85 degree) are each cited disclosing holes subtending at an angle of 80~100° as claimed. It therefore would have been obvious to one having

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ordinary skill in the art, with predictable results, to modify the system/arrangement of Iwamoto, to include the angle of 80~100°, as taught by either Lee or USSR'768, with no change in their respective function, for the purposes of enhancing the washing of the wafer. It is old and well known, through routine experimentation, to position spraying arrangements, in various angles, to optimize the washing effect (see MPEP 2144.04 REVERSAL, DUPLICATION OR RE-ARRANGEMENT OF PARTS). In regard to the at least one discharge pipe connected to a lower part of said cleaning chamber, Cheng (as at 87, 88) is cited disclosing the discharge pipe as claimed. It therefore would have been obvious to one having ordinary skill in the art, with predictable results, to modify the system/arrangement of Iwamoto, to include a discharge pipe connected to a lower part of said cleaning chamber as taught by Cheng, with no change in their respective function, for the purpose of enhancing the cleaning process. It is old and well known in the art to provide plural drains to rapidly remove processes liquids, in an effort to prevent any floating contaminants from re-depositing onto the wafer. In regard to the source of cleaning solution, Cheng (as at 61) is cited disclosing the source of cleaning solution as claimed. It therefore would have been obvious to one having ordinary skill in the art, with predictable results, to modify the system/arrangement of Lu, to include a source of cleaning solution as taught by Cheng, with no change in their respective function, for the purpose of multi-tasking the container. It is old and well known in the art to use the same container for washing and other liquid treatments, to save the expense of plural individual treatment container. All of the claimed elements were known in the prior art and one skilled in the art could have combined the elements as

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claimed by known methods with no change in their respective functions, and the combination, (i.e., the combination of known old elements into a single device) would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Re claim 2, to employ a specific number of nozzles is deemed to be an obvious extension/duplication of the teachings of the applied prior art (see MPEP 2144.04 REVERSAL, DUPLICATION OR RE-ARRANGEMENT OF PARTS). This is also applicable to the dimensions as claimed in claims 3 and 10, and the corresponding dimensions of the applied prior art .

4. Claims 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the applied prior art as applied to claim 1 above, and further in view of either Japan'175 (Japan 10-135175) or Japan'992 (Japan 9-190992).

Claim 4 defines over the applied prior art only in the recitation of the two discharge pipes. Japan'175 and Japan'992 are each cited disclosing the two discharge pipes as claimed. It therefore would have been obvious to one having ordinary skill in the art, with predictable results, to modify the system/arrangement of either Iwamoto or Lu, to include a discharge as taught by either Japan'175 or Japan'992, with no change in their respective function, for the purpose of enhancing the cleaning process. It is old and well known in the art to provide plural drains to rapidly remove processes liquids, in an effort to prevent any floating contaminants from re-depositing onto the wafer. All of the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination, (i.e., the combination of known old elements

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into a single device) would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In Kramer et al., Suzuki et al., Shindo et al., Vetter et al., Huh et al., Katwatani et al., Kim, Ko et al., and Egashira et al., note the nozzle arrangements.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRANKIE L. STINSON whose telephone number is (571) 272-1308. The examiner can normally be reached on M-F from 5:30 am to 2:00 pm and some Saturdays from approximately 5:30 am to 11:30 am.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached on (571) 272-1700. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).